

# SMITHSONIAN Zoogoer

For members of **FRIENDS OF THE NATIONAL ZOO**  
JULY | AUGUST | 2012

## American Treasures

Our newest exhibit celebrates  
the continent's wild treasures.

- » Biodiversity and Human Health
- » Animal Artists
- » The Amazing Armadillo



Great day.

Good day.

10

## American Trail

The Zoo got its start as a refuge for imperiled North American animals.

Now we're returning to our roots with a dazzling new exhibit that focuses on the continent's wildlife treasures.

BY CRISTINA SANTIESTEVEN

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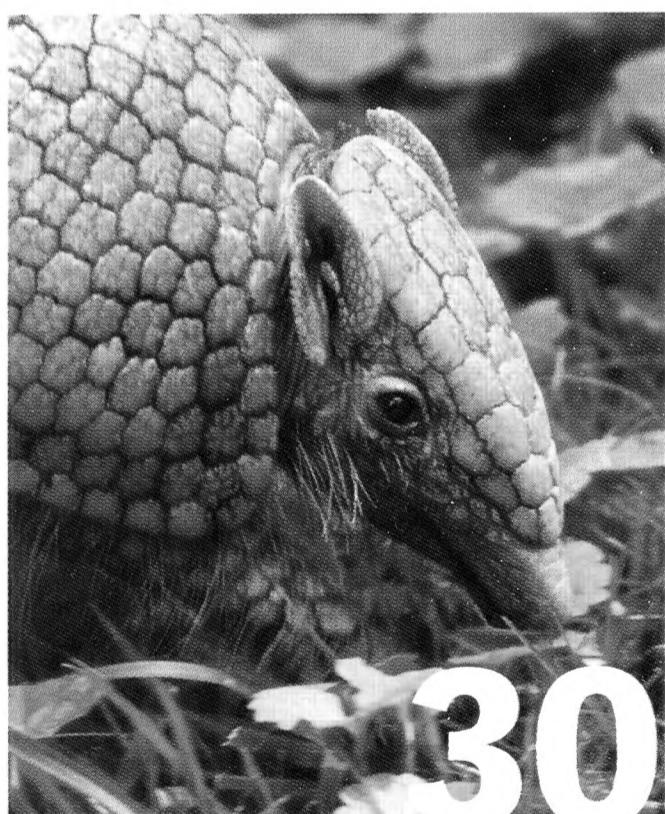


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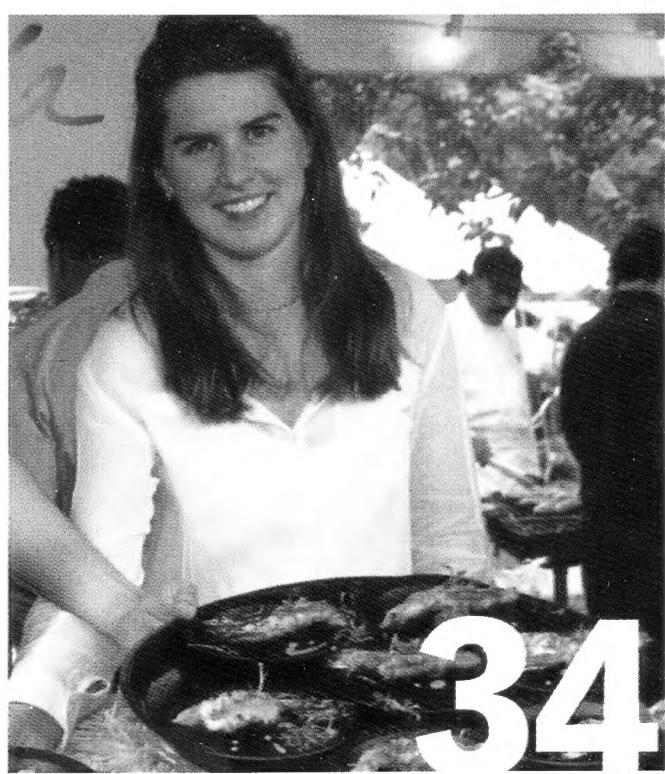
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JESSIE COHEN/NZP

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What a big paw you have!

# SMITHSONIAN Zoogoer



is the dedicated partner of the Smithsonian's National Zoological Park. FONZ provides exciting and enriching experiences to connect people with wildlife. Together with the Zoo, FONZ is building a society committed to restoring an endangered natural world. Formed in 1958, FONZ was one of the first conservation organizations in the nation's capital.

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**On the cover:** Selkie, a gray seal, eats eight pounds of fish a day. PHOTO BY MEHGUN MURPHY/NZP



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MIX

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**“MEMBERSHIP HAS ITS PRIVILEGES.”** That popular credit card slogan came to mind as I thought about the many rewards of being a Friend of the National Zoo. FONZ members’ exclusive benefits include free parking, discounts in our shops, special deals on event tickets—and, of course, this beautiful magazine. Diverse though they are, each benefit serves the same goal: to help us remain connected to you and offer you the unique resources of the Smithsonian’s National Zoo.

One important way that we do that is by creating special opportunities for members to share in the Zoo’s key moments. Back in 2005, FONZ members delighted in sneak peeks of Tai Shan, our incredible giant panda cub. More recently, you had the opportunity for first viewings of our seven newborn lions.

In early May, FONZ members were the first guests to meet our 11 new Asian small-clawed otters. Your excitement and joy at watching the spirited, water-diving otters was electrifying. You loved the event and the animals, from Rutabaga to Kevin. They seemed to be delighted to see you as well.

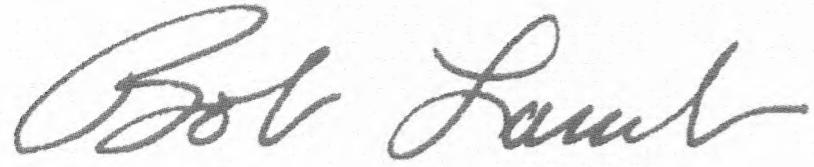
As you have likely heard, we have two new cheetah cubs being hand-raised at the Zoo. They’re the result of a challenging birth by a first-time mother at our Front Royal research facility, the Smithsonian Conservation Biology Institute. These cubs are scheduled to go on public view soon. Once these adorable cubs are ready to meet the public, we will provide you with information on when to see them.

We are also approaching the opening of American Trail, with new and improved exhibit areas for species ranging from ravens to sea lions. The multimillion-dollar seal and sea lion habitat is a magnificent new exhibit both for the animals and the viewing public. The opening of American Trail, roughly 20 percent of the exhibit area of the Zoo, will delight not just our animals, but you! (You can learn more from the Zoo Director’s letter on the next page and the feature that starts on page 10.)

American Trail opens to the public at noon on Saturday, September 1. FONZ members will be invited for a preview visit of the area from 8 a.m. to 5 p.m. on Friday, August 31, and from 8 a.m. to noon on September 1. Please watch for details on our website or, better yet, share or update your email address with us at [fonz.org/email](http://fonz.org/email) so we can keep you informed about special FONZ-only events and other Zoo happenings.

Summer is a busy time, I know. But I urge all our valued members to carve out a chance to come to the Zoo and enjoy another special benefit of being a FONZ member!

Sincerely,

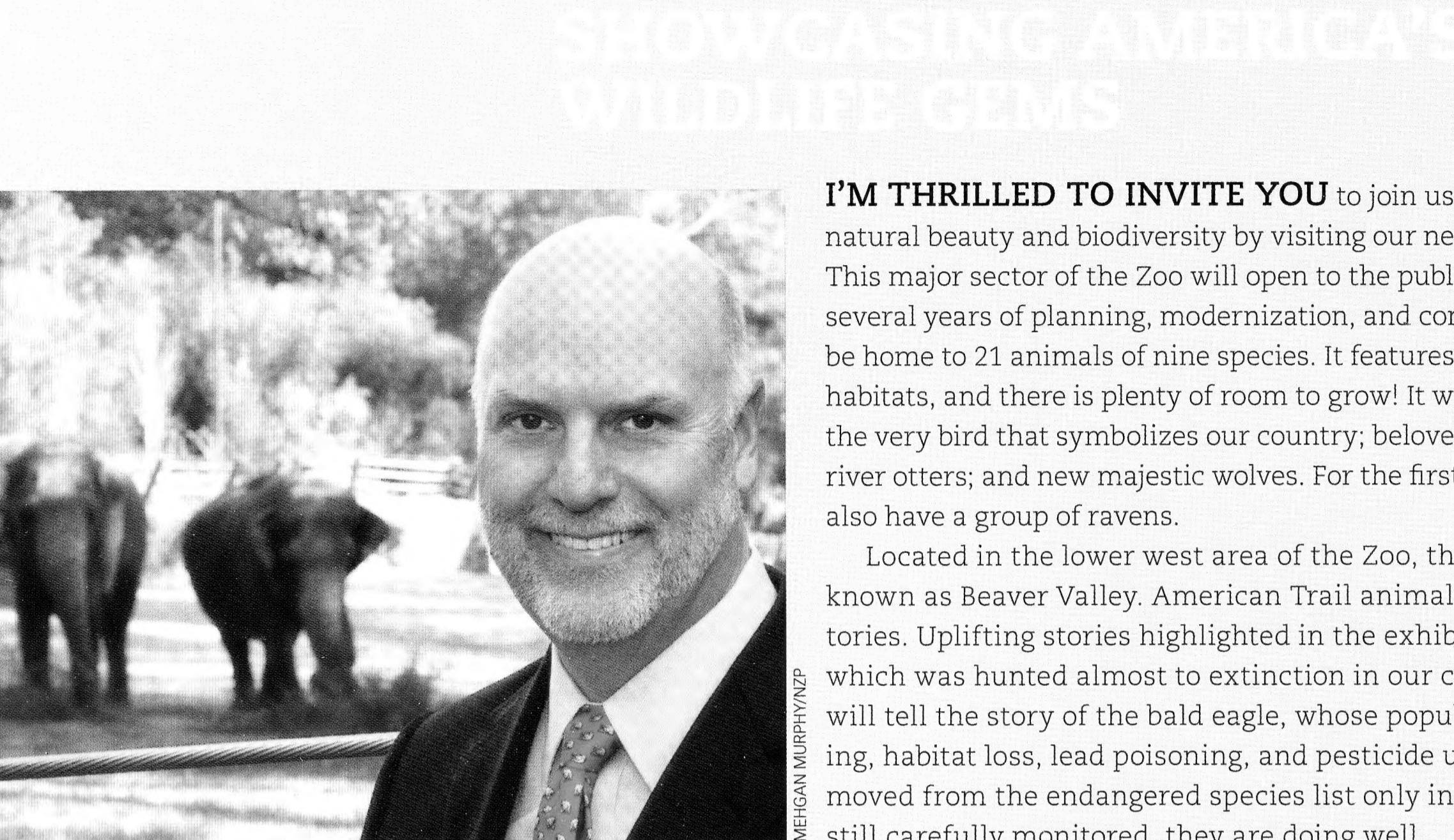


Bob Lamb

Executive Director, Friends of the National Zoo



MEGHAN MURPHY/NZP



MEGAN MURPHY/NZP

**I'M THRILLED TO INVITE YOU** to join us in celebrating our country's natural beauty and biodiversity by visiting our newly redesigned American Trail. This major sector of the Zoo will open to the public over Labor Day weekend after several years of planning, modernization, and construction. American Trail will be home to 21 animals of nine species. It features stunning new seal and sea lion habitats, and there is plenty of room to grow! It will also be home to our bald eagle, the very bird that symbolizes our country; beloved species such as brown pelicans; river otters; and new majestic wolves. For the first time in the Zoo's history, we'll also have a group of ravens.

Located in the lower west area of the Zoo, this new exhibit was formerly known as Beaver Valley. American Trail animals represent conservation victories. Uplifting stories highlighted in the exhibit include those of the beaver, which was hunted almost to extinction in our country for its soft, warm fur. We will tell the story of the bald eagle, whose population was decimated by hunting, habitat loss, lead poisoning, and pesticide use. Our national bird was removed from the endangered species list only in 2007. Although both species are still carefully monitored, they are doing well.

The individual animals on American Trail represent stories of strength and perseverance. Eight of our animals were rescued from the wild after being orphaned or injured. Selkie, a gray seal who is now blind, was a naval operative during the Cold War. We hope seeing these beautiful animals will inspire a new generation of scientists and policymakers to protect all species, endangered or otherwise.

Thanks to the generous support of the Buckley-Horowitz Fund and the Coca-Cola Foundation, the new facilities are state of the art and designed to meet each animal's specific physical, emotional, and intellectual needs. The new exhibit doesn't just conserve wildlife, it also conserves resources. As testimony to our commitment to build new sustainable exhibits, the new seal and sea lion pools use recycled, filtered water. New water is only added to replace what evaporates.

The animals are not the only ones to benefit from the refurbishment; so do human visitors. Meticulous landscaping incorporates plants native to the diverse ecosystems encountered across the country, creating a more complete experience for our visitors. Amphitheater seating allows visitors to get the best view of the natural behaviors of seals and sea lions. Visitors even have the opportunity to get their own flippers wet by stopping by a tidal pool, complete with models of some of the sea life from these unique ecosystems, and there is a new opportunity for food, drink, and treats while enjoying American Trail.

This wonderful new exhibit would never have been possible without the Zoo's sponsors, donors, visitors, and staff, and I can't thank you enough for your support. It's with a particular patriotic pride and excitement that I welcome you to American Trail this Labor Day!

Sincerely,

Dennis Kelly  
Director, Smithsonian's National Zoological Park



JEN ZOON/NZP



JEN ZOON/NZP

## Otter Family Makes a Splash

The Zoo welcomed a family of eleven Asian small-clawed otters thanks to a gift from Whole Foods Market that covered the cost of transporting the animals from the Santa Barbara Zoo in California. The Asia Trail exhibit includes one of the largest otter exhibits in the country and is designed to house a family. Because otters are highly social animals, having a larger group will allow the Zoo to learn more about the species' behaviors and social dynamics.

Asked to name the otters, Whole Foods Market served up a delicious array of (mostly) gastronomic choices. The parents are now named Chowder and Clementine; the young otters are Pork Chop, Pickles, Saffron, Olive, Peaches, Turnip, Radish, Rutabaga, and Kevin. The company's Facebook fans selected the name Rutabaga.

Asian small-clawed otters, which live primarily in Southeast Asia, are endangered as the result of habitat destruction, hunting, and pollution. This is particularly worrying because they are considered an indicator species, which means that the health of their populations typically reflects the health of nearby species and the ecosystem as a whole.



ADRIENNE CROSLER/SCBI

## Two Cheetah Cubs Survive Unconventional Birth

Cheetah births are never routine, but the Zoo's two newest cubs, born April 23 at the Smithsonian Conservation Biology Institute, made a particularly dramatic entrance. Ally, a first-time mom, gave birth to one cub, which she abandoned—a practice that is not uncommon for new cheetah mothers in human care. Zoo staff removed the cub to be treated for hypothermia.

Several hours later, head veterinarian Copper Aitken-Palmer heard heartbeats that suggested Ally was carrying more cubs. She decided to perform a cesarian section, which is an uncommon procedure in cheetahs and a very dangerous one for cubs. After three hours of CPR, medication, rubbing, and other

treatments, Zoo staff were able to save one of the three cubs removed surgically from Ally.

Both cubs were kept in intensive care for three days, but now both cubs and Ally appear to be doing well. The cubs were transported to the Zoo in May and are being hand-raised by Zoo staff.

Cheetahs are considered vulnerable by the International Union for Conservation of Nature, so every cub counts. Eighty percent of cubs born in human care survive their first six months; that rate in the wild is as low as 30 percent. The survival of these two cubs will help ensure the genetic diversity of the North American cheetah population.

## Dhole Discovery

A species of wild dog that lives primarily in Southeast Asia, dholes are endangered, primarily due to habitat loss. That means that knowing more about habitats that allow them to thrive, and then acting to preserve these areas, could make a big difference in their future.

A new study led by Smithsonian Conservation Biology Institute research associate Kate Jenks used four years' worth of data from protected areas in Thailand to identify factors that influence how suitable an area is for dholes. The researchers found that while vegetation type does not seem to affect dhole populations, they rarely live at elevations higher than 500 meters (about 1,650 feet). The factor that correlated most strongly with dhole populations was the presence of sambar, large deer that dholes often hunt.

The researchers plan next to study dhole population distributions beyond the boundaries of protected areas. These areas may well be particularly important to dhole survival because the study found that only 7 percent of protected land in Thailand is likely suitable for these wild dogs.



COURTNEY JANNEY/NZP

## Fishing Cat Twins Are a First for the Zoo

The Zoo is pleased to welcome two newborn fishing cats, which are notoriously tricky to breed. This is the first successful birth at the Zoo and only the second in the country since 2009. The mother, Electra, mated with the father, Lek, after having little interest in the first male the Species Survival Plan for fishing cats recommended based on genetic variability.

Zoo staff have been studying Lek and Electra carefully to try to develop a more successful breeding procedure. In addition to noting behaviors like grooming and nuzzling, researchers are also studying stress and reproductive hormone levels. The successful birth of two new kittens is also important for the genetic diversity of the captive population in the United States.

Fishing cats are now considered endangered after population drops in the past two decades, primarily as a result of water pollution, poaching, and shrimp farming.



NICK GARBUUT/NATUREPL.COM

## Voters Name Baby Howler

**O**n March 22, the Zoo welcomed its first baby black howler monkey, a male born to new parents Chula and Pele. The Zoo asked Facebook fans to select a name for the new monkey, and the winning name was Loki. The name honors the Norse god of mischief, which is fitting for a baby who has already been caught trying to steal his mother's food. When not making trouble, baby Loki enjoys exploring the world around him through touch, taste, and walking along tree branches.

Black howler monkeys, which live in Central and South America, are the loudest animals in the Western Hemisphere: Their calls can travel as far as three miles in the forest. They are considered a species of least concern by the International Union for Conservation of Nature.



JANICE SVEDA, SMITHSONIAN'S NATIONAL ZOO

## Mark Your Calendar

### Aug. 17 **A Cheetah Celebration**

Join Smithsonian's National Zoo keepers, scientists, vets, and cheetah cubs in an evening dedicated to cheetahs! Enjoy delicious food and drinks. Learn more at [fonz.org/ambassadors.htm](http://fonz.org/ambassadors.htm).

### Sept. 1 **Exhibit Opening: American Trail**

Two spectacular environments—land and water—come together in the Zoo's new American Trail exhibit. Guests are greeted by a variety of animals along their journey, including sea lions, seals, beavers, ravens, river otters, wolves, and bald eagles. Learn more at [fonz.org/americantrail.htm](http://fonz.org/americantrail.htm).

### Sept. 20 **Grapes With the Apes**

Sample fine wines while learning about and supporting ape conservation. Learn more at [fonz.org/grapes.htm](http://fonz.org/grapes.htm).

## Young Lions Leave the Zoo

Two years ago, seven lion cubs stole our hearts, and since then we have enjoyed watching them grow up—but that means that it is time for them to move on. Baruti and Aslan headed to Calgary Zoo this summer. This was the final step in the cub management process Zoo keepers have been orchestrating since their birth. The lions will be matched with mates as part of the Species Survival Plan for African lions. The Zoo's ten lions shared the yard until the beginning of this year, when they were separated by sex.



## SCBI Makes Strides In African Wild Dog Research

In a recently published paper, SCBI research associate Penny Becker used 11 years of genetic and behavioral data to study reproduction in African wild dogs. She learned that the dogs carefully avoid inbreeding. Under ideal conditions, that would be a good policy—inbreeding destroys genetic diversity and can hurt species survival. But because African wild dogs are

endangered, with only 4,000 to 5,500 individuals left in highly fragmented populations, a strict policy against inbreeding can increase the likelihood of small populations disappearing entirely. Becker hopes the new research encourages conservationists to artificially move animals to reduce the effect of inbreeding avoidance on population size.

A distinctive new part of the Zoo experience is the novel dining options from our partner Sodexo. A premier provider to cultural destinations around the world, Sodexo is working with FONZ to create dining options that are not only exciting and delicious, but also demonstrate a commitment to local, seasonal, sustainable ingredients, and balanced and nutritious menu items.

Earlier this spring, Sodexo assumed responsibility for the café and concessions in 18 outlets throughout the Zoo as well as catering for special events.

The team has already been busy with providing new options at Panda Plaza, including an Italian Kitchen, Po'Boy Shack, and some custom designed food carts serving unique items like brisket nachos and roasted corn. More exciting changes are still in the works, including a new venue that will open on American Trail in September, some food carts that feature local flavors centering on the Zoo's ever-important mission of sustainability, conservation, and restoration. Come HUNGRY on your next visit!

The tasty grilled chicken sandwich at the Mane Café features all-natural, antibiotic-free, vegetarian fed chicken breast.



PHOTOS COURTESY OF SODEXO



PHOTOS COURTESY OF SODEXO



MICHAEL SZYKMAN/GUNTHNER/SCBI

## NEW ART OPPORTUNITIES

Kaman's Art Shoppes, a newcomer to the Zoo's grounds, is now providing a range of exciting new ways to remember your trip to the Zoo. Children of all ages can become a pirate, a princess, or a favorite Zoo animal at the face painting and glitter tattoo booths across from Panda Plaza and by the bridge to the Bird House. For a longer lasting souvenir, photographers are located at Zoo entrances and near the Mane Café to capture your whole family, and hand-drawn caricatures in color or black and white are available near the entrance of the Great Ape House. Visitors can also help create their own memento near Lemur Island, where artists are available to help turn handprints into creatively personalized animal drawings.



# Americans Coming Home to an **AMERICAN**

BY CRISTINA SANTIESTEVAN



MEGAN MURPHY/NZP

Daily, the staff at the National Zoo work tirelessly with endangered species native to countries around the world. But this fall the Zoo will be celebrating a bit of good ol' Americana in the form of furry, feathery—and flippery—friends. The new exhibit area, American Trail, will feature animals near and dear to American visitors, reminding them of the natural treasures in their own backyards. Fan favorites seals and sea lions will return to new spectacular pools, which they'll share with pelicans. Guests will delight in the antics of the beavers and river otters, who have been off exhibit for the last two and a half years as construction progressed. And America's national animal, the bald eagle, will nest on exhibit not far from new ravens, particularly intelligent birds. And for the first time, gray wolves will join the Zoo's collection as ambassadors for a species that has been making a comeback.

"We spend a lot of time at the Zoo talking about pandas and talking about elephants. But there is some phenomenal wildlife right here in North America," explains exhibit developer Cheryl Braunstein. "We should learn more about it, appreciate it, and take care of it."

That's the theme for American Trail, which is scheduled to open Labor Day weekend, in the area formerly known as Beaver Valley. In the style of the popular Asia Trail exhibit, American Trail will lead Zoo visitors past numerous exhibits dedicated to North American wildlife.

"These animals are so cool," says Malia Somerville, one of several keepers assigned to American Trail. "Even the



SMITHSONIAN'S NATIONAL ZOO



**Journey through our stunning new exhibit to encounter some true national treasures.**



The pelicans that grace American Trail were rescued after sustaining injuries in the wild.

MEGHAN MORPHIN/ZP

## VOICES FROM AMERICAN TRAIL

**RAVEN** — "I'm excited about ravens because they are a new species for us," says Somerville. "They are very intelligent. They are able to figure out really complex programs. And, since we will have a group of them together, we'll be able to see some of their social interaction."

**GRAY WOLF** — "I'm really thrilled about the wolves," says Miller, who explains that the Mexican wolves the Zoo had previously were part of a reintroduction program, and were intentionally kept as wild as possible. This limitation won't apply to the gray wolves. "We've never been able to train or interact with them on more than a husbandry level. We'll be able to encourage more interaction with these wolves."

### SEALS AND SEA LIONS —

"Make sure to come for a sea lion demonstration," says Somerville. "We're going to have at least two each day."

**SEA LION EXHIBIT** — "Before we closed, we had an underwater viewing window into the sea lion exhibit. It was interesting, but it was nothing like what we're going to have," says Davies. "What we will have will be phenomenal. You will literally feel like you are in the water with the animals. There won't be any ambient daylight behind. You will be in a cave. Except for not being wet, you will feel like you are in the water with the animals."

beavers. When people get up close to this wall, and there's a beaver right in front of them, they always marvel, 'Oh my gosh, they are so big' and 'Look at that tail.' You don't really appreciate them until you can see them up close." Rebecca Miller, another keeper assigned to American Trail, agrees. "I think the beavers are one of the coolest animals we have here. People really are amazed when they see them."

That's one of the best things about this new exhibit. American Trail is an opportunity for Zoo visitors to get nose-to-nose with some of America's most iconic—and coolest—wildlife.

### Repairing the Leaks

American Trail started as a life support improvement project. "The seal and sea lion pools we had before were built in the late 1970s. They were state-of-the-art at the time, but obviously had become outdated. The original project was supposed to fix all that," explains Somerville. "It's expanded a bit since then."



JESSIE COHEN/NZP



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That relatively modest project was a necessity. Much has changed in the way we care for and house marine mammals since the 1970s. And there were repairs that needed to be done. The facility needed to be updated, a chiller was malfunctioning, and pumps were outdated. Plus the exhibit was leaking.

"We were losing 150,000 gallons of water a day," says facilities manager Dan Davies. "We had a waterline feeding the pool. A three inch line. 120 pounds of pressure. And it wasn't keeping up."

The renovation fixed that leak and accomplished quite a bit more besides.

There will be more shade, to protect the seals' and sea lions' sensitive eyes. And the pool bottom will be a dark, non-reflective color. It will look more natural to visitors, and will help reduce the glare from the sun. "It won't have that reflective swimming pool look," explains Miller. "It will look very natural."

There will be no confusing the new seal and sea lion exhibit with a swimming pool. In fact, it may be easy to forget the exhibit is in Washington, D.C., or that it is even an exhibit. Lichen-covered boulders surround the pool. Waves will ripple across the surface of the water. There may

**American Trail began as a plan to repair the seal and sea lion habitat. It then grew into a major new exhibit on North American wildlife—the Zoo's original focus when it was established in 1889.**

even be a faint smell of salt in the air, since the new exhibit is designed to support salt water.

"When you walk into the exhibit, you'll have a moment when you feel like you are somewhere else," says Chuck Fillah, who oversees and facilitates the entire project. "That's the idea. You'll remember that moment."

That's the whole point, explains Marc Muller, who is design and construction manager for American Trail. "We found a place called Devil's Churn on the Oregon coast. That's what the seal area emulates. We took pictures, and they are replicating the pictures."

The West Coast feel extends beyond the seal and sea lion pool. Boulders wrap around the pool and stand tall alongside the ADA-compliant walkway. Conifer trees line the hillside, where gray wolves prowl and ravens chatter. The buildings—home to filters and life-support equipment, behind-the-scenes space for animals, and offices for keepers—look

When you visit  
American Trail,  
you'll want to...

- Dip your toes in the wading-friendly tide pool.
- Stop to chat with the ravens. You may be surprised by their smarts and humor.
- Time your visit so you can listen to one of the regularly-scheduled keeper talks.
- Duck into the cave near the sea lion exhibit for an underwater view of their pool. There's a good chance a sea lion will swim by to say "Hello!"
- Extend your exploration of the Americas by continuing on to Amazonia, which is just beyond American Trail.

like they'd be right at home on the foggy Pacific coast. There's a tide pool for wading in (yes, really!), which looks much like a typical tide pool on a West Coast beach. Adults and children are invited to strip off their shoes and socks, roll up their pants, and splash through the tide pool.

"This is an area for play," says Braunstein. "The idea is that kids can take their shoes off and get their feet wet. It's a pretty dynamic wading pool. To our knowledge, this hasn't been done anywhere else." Just like a real tide pool, the water moves and swirls around, entering and exiting the exhibit on a two-minute cycle. The tide pool also features models of several species that live in tide pools, which visitors are invited to touch and explore. "There's a lot of natural history in there," says Braunstein. "One

of the big messages we have is that if you were out in a coastal environment and in a real tide pool, you would have to respect the animals that live there. We've created this space for you, but in the wild, it's those animals' home."

American Trail will be a fun, beautiful, and impressive exhibit. There's no denying that. But, from the perspective of the people who care for the animals, the most important part of this exhibit is buried underground. There, in concrete beneath the new, ADA-compliant walkways, run countless yards of water pipes, sewer pipes, and utilities, including the cables and utilities that support several other sections of the Zoo's 163-acre campus.

"If you were to take the top off of what we've done, what's underneath—down to



JESSIE COHEN/NZP

a depth of probably ten feet in some places—is solid utilities," says Davies. "Pipes coming and pipes going. Sewer. Electric. Water. System water distribution. It's massive pipes, and packed in there tight. We literally ran out of space."

The system is designed to last a very long time. The pipes have a lifespan of 150 years and are encased in a flowable fill, which will prevent them from shifting in the future. These utilities should not require maintenance for a very, very long time. That's a good thing. Because, once this project is complete, the construction crew won't be able to bring their heavy equipment into the area. They are literally building themselves out of the exhibit space, much as a homeowner might paint herself out of a room.

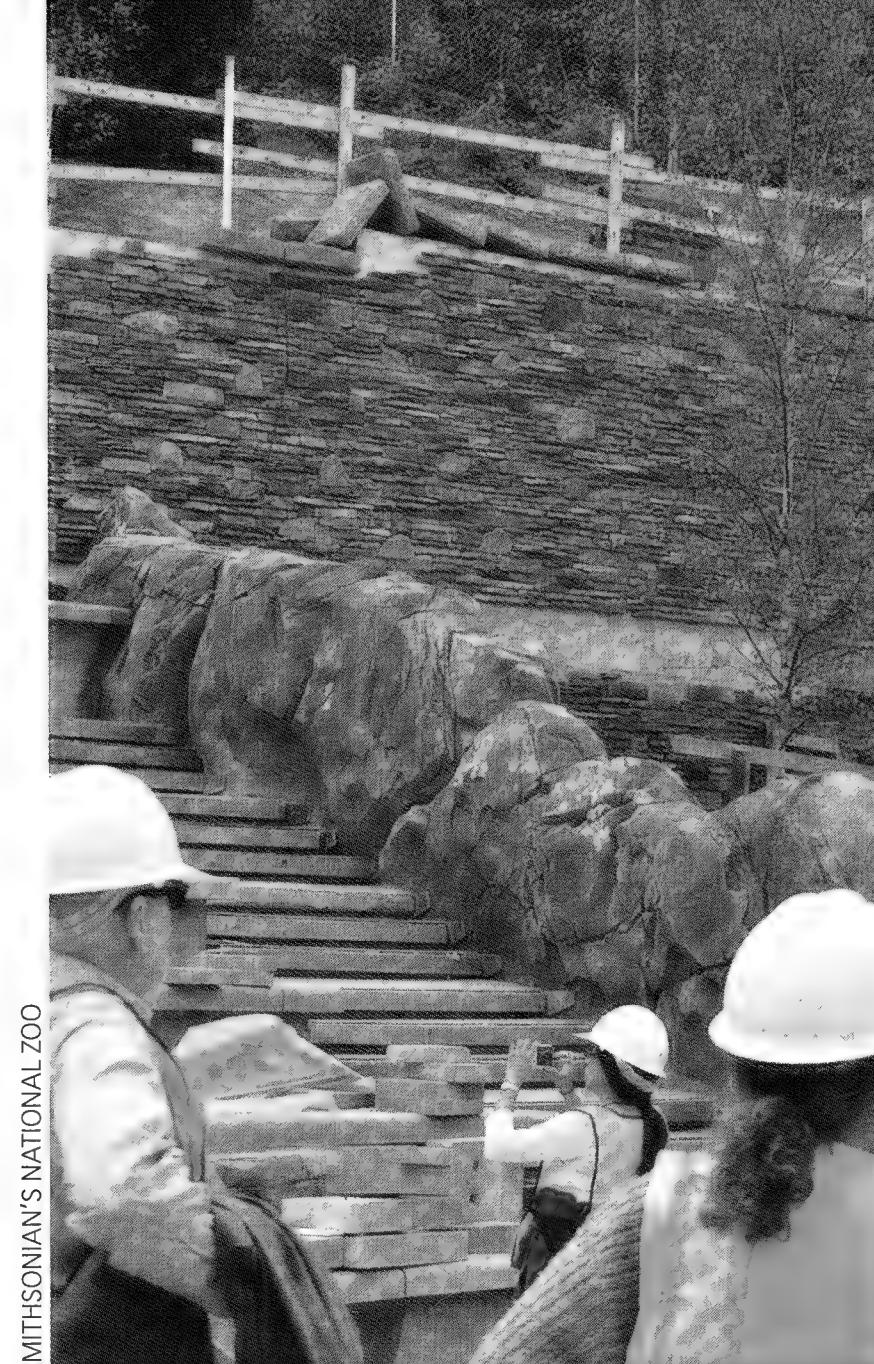
"They literally have to back out of the job. They have to sequence their work in a way that enables the big stuff to go in while they still have access," says Davies. "We will leave behind construction that will prevent us from reentering the space." That construction includes trees and naturalistic rocks and ADA-compliant walkways. When the last of the construction equipment pulls out of the space, they will leave a little slice of West Coast-inspired America behind.

### Backyard Treasures

American Trail is about North American animals, but it's also about survival.

Nearly every animal in this exhibit has flirted with the endangered species list. Bald eagles and pelicans nearly disappeared before DDT was banned in the United States in 1972, and were both listed as endangered until recently. Beavers and river otters, although never officially listed on the U.S. Endangered Species List, were both once heavily hunted for their pelts and oils. They, too, have since recovered.

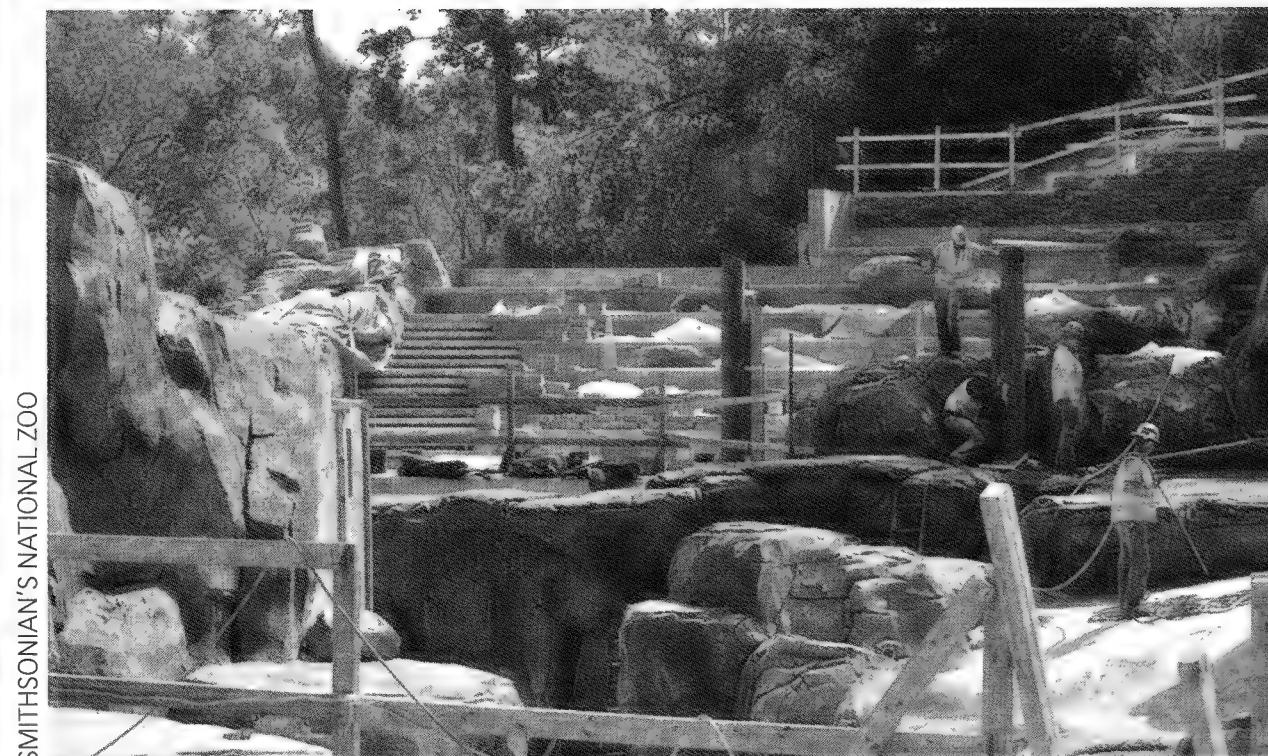
"This is really a conservation success story," says Somerville. "For example, beavers are really common now. We've probably all seen them. But there was a time where they nearly went extinct, and we almost lost them. We wouldn't have species like beavers if we didn't make an effort to conserve them. Same with wolves and eagles and the rest."



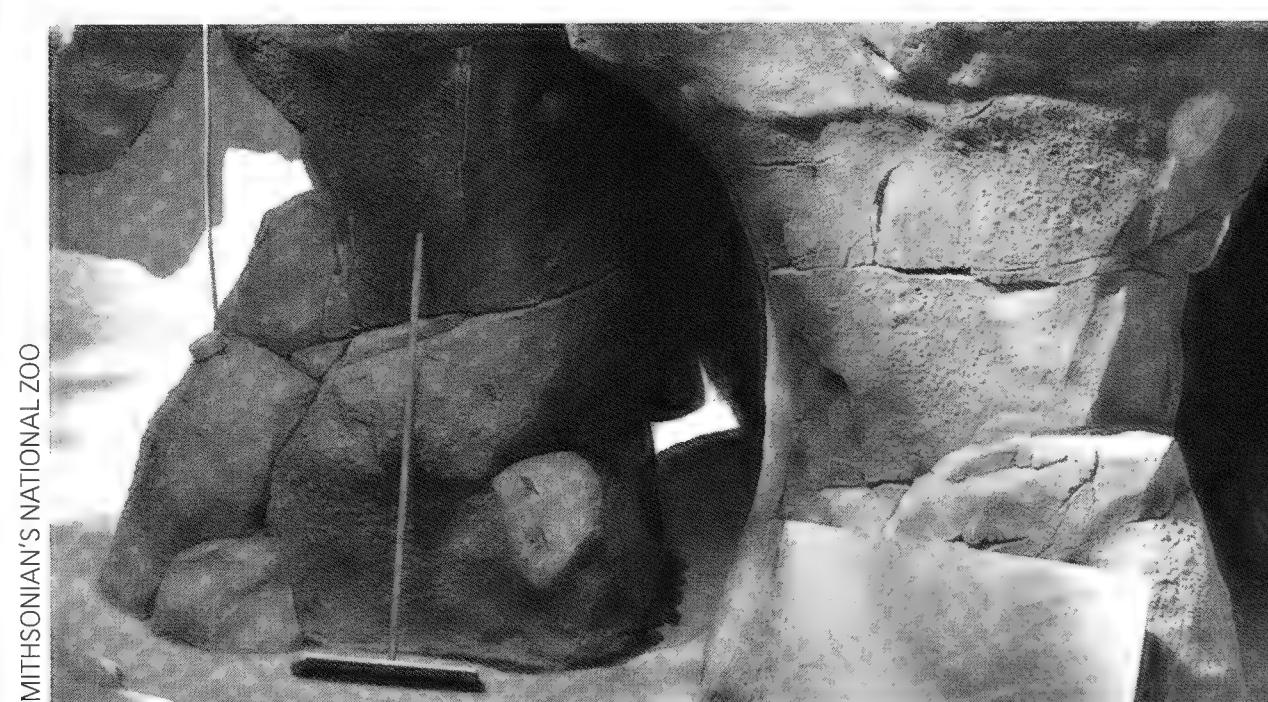
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FACING PAGE: Back on exhibit for the first time in nearly three years, North American river otters can grow almost a meter long.

THIS PAGE: This multi-year construction project features sustainable designs and practices to save water and energy.



SMITHSONIAN'S NATIONAL ZOO

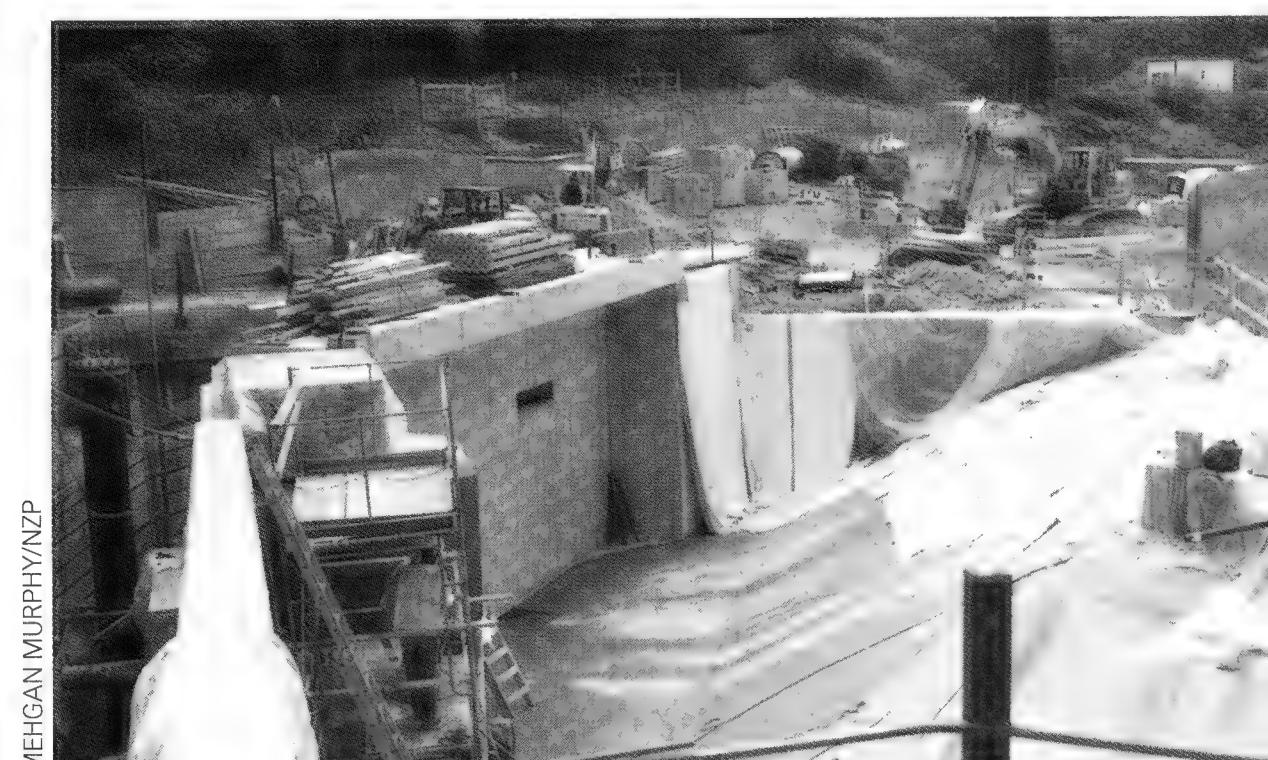


SMITHSONIAN'S NATIONAL ZOO

As Somerville explains, these stories of success and survival extend even to ravens. "Okay, they're common. But we're glad they're common. That's a good thing. That means we're doing something right."

Some of the animals here have personal stories as well. The bald eagle fell from his nest as a chick, and cannot fly. Several of the ravens are wild birds that suffered injuries, and can no longer survive on their own. The pelicans are also rescues. Summer and Calli, two of the California sea lions, are also rescues, but what's really exciting is that Calli is bringing Sophie, who was born a year ago at the Pittsburgh Zoo and PPG Aquarium where the sea lions have been residing. Selkie the gray seal retired from the U.S. Navy Marine Mammal Program. "Since we have so many North American species, we are able to provide homes for rescued animals," explains Somerville. "I think this is a good role for us."

Many of these stories—whether about conservation successes for whole species, or the histories of these individual animals—will be shared through multiple keeper talks every day. During these talks, visitors will have an opportunity to learn more about the animals, ask questions, and watch as keepers care for and interact with the animals. These keeper talks will also be an opportunity to get to know the American Trail animals as individuals.



MEGHAN MURPHY/NZP

This is what American Trail offers Zoo visitors. Here, visitors will get a chance to learn the names of the Zoo's beavers and seals and wolves, while also meeting some of America's most iconic wildlife.

"We tend to walk by our own wildlife," says Vince Rico, curator of American Trail. "We save our money to go to Africa. We save our money to go to these international destinations and see these wonderful animals from around the world. But we don't have to go that far. There is amazing wildlife right here in North America. In our own backyards." **SZ**

— CRISTINA SANTIESTEVAN is a regular contributor to Smithsonian Zoogoer.



EMERGING

# cooks for you?

BY AARON FERSTER



## RESEARCH SHOWS HOW BIODIVERSITY IS GOOD FOR OUR HEALTH.

**W**e began to hear the calls when the evenings were first warm enough to leave the windows open during dinner. It was that delightful time of year in the Washington area when the cold of winter is just about forgotten, but before the heat and humidity arrive. The last hues of sunlight linger just a bit longer each evening before surrendering to darkness.

A random lull in the family conversation was broken by an unmistakable sound coming from behind the house: *hoo hoo to hoo, hoo hoo to hoo aw*. The final verse trailed off with a noticeable warble.

The girls looked up, wide-eyed and open-mouthed. We all shared one thought: "OWL!"

We rushed to the window to scan the woods beyond the back fence. A few moments passed. Then we heard the call again. There! On the upper branches of a tall, thick-trunked pin oak not more than a few meters beyond the boundary between our suburban yard and the forest behind our house was the unmistakable silhouette of an owl.

The bird gazed in our direction for a beat, then looked away. We were able to steal a few more glances before it leaned forward off its perch, made a sharp, arching turn,

and glided into the woods. Two silent wing beats later, our dinner guest was gone, seemingly evaporating before our eyes as it passed from open sunlight into the dappled shadow beyond. Like a ghost.

### Owl Encounters

That was not our only encounter. Far from it. The owl interrupted dinner again the next night, and the night after that. In fact, by the time we surrendered to the summer heat and sealed the windows in favor of air conditioning, we just about expected owl calls to be part of the evening's banter. A nesting pair had taken up residence somewhere just beyond our little cul-de-sac.

At about a foot and a half from their talons to the tops of their rounded heads, our owls were easily the biggest birds around. They had mysterious, chocolate-brown eyes that made it hard to tell exactly where they were looking and concave, moon-shaped faces. Their chest feathers were a mix of off-white with brown vertical streaks.

My favorite passage about barred owls in our field guide describes their distinctive “handle,” or call. The book compares it to a person’s insistently asking “Who cooks for you? Who cooks for you all?”

The girls found dozens of owl pellets beyond the fence. By picking them apart, we could decipher what the owls had been eating for dinner. It was mostly rodent bits; small jawbones with tiny, perfect teeth were common. Sometimes we found red scales and what looked like miniature lobster claws, a clue that our owls were plucking crayfish out of the creek below the nearby playground. It was fun to imagine the owls perched on the top of the swing set, watching for unsuspecting crayfish in the moonlight, and then swooping in for a meal.

We learned a lot from our new neighbors. And not long after their first appearance, I began to learn about a research program at my new job at the U.S. Environmental Protection Agency (EPA). The research explores how important such neighbors could be. As it turns out, the diversity of wild species and natural communities—biodiversity—that surrounds us could very well have an impact on public health. This vital relationship is the subject of a new exhibit in the Zoo’s Amazonia Science Gallery (see page 21).

## A Link to Lyme Disease

“An emerging body of scientific evidence shows connections between the loss of biodiversity and human health, specifically the emergence of infectious diseases,” explains Montira Pongsiri, a scientist and colleague of mine at EPA. She helps lead the agency’s biodiversity and human health research. This collaborative effort (the Smithsonian is one partner) aims to better understand how human-caused changes to biodiversity are linked to public health risks, such as the transmission of disease-causing agents from animal hosts and vectors to people.

Much of the work is conducted by interdisciplinary research teams, supported in part by EPA research grants, bringing together a variety of experts—ecologists, biologists, public health officials, social scientists, and others—to integrate data on ecosystems, biodiversity, public health, and human-caused stressors to the environment.

One such expert is Richard S. Ostfeld, a self-described “disease ecologist” and a senior scientist at the Cary Institute of Ecosystem Studies in the Hudson River

equal-opportunity suckers. They latch on to whatever source of blood meal happens to wander by: white-footed mouse, deer, barred owl, skunk, possum, or human.

The source of blood may not matter to the tick, but it turns out to be a major risk factor for people. To study this, Ostfeld and his research partners send field teams into the forest to find out what animals are living there. The teams set out baited live-traps and painstakingly inspect each animal caught for ticks. Any ticks they find are carefully removed and sent to a laboratory to determine if they harbor *Borrelia burgdorferi*, the bacterium responsible for Lyme disease.

Repeated results show that white-footed mice and eastern chipmunks are very efficient, as compared with gray squirrels and opossums, at transmitting *B. burgdorferi* to black-legged ticks. It follows then that the risk of someone’s being exposed to Lyme disease from a tick bite would be higher if that same tick had previously fed on a white-footed mouse or a chipmunk, instead of some other kind of animal. Without a full complement, or diversity, of critters, there are fewer tick hosts available to “dilute” the transmission of disease from tick to human.

From a public health perspective, the dilution effect boils down to this: The more white-footed mice there are (and the less diversity there is in the animal community), the higher the risk of people’s getting Lyme disease. And a relative abundance of white-footed mice is exactly what happens in the typical scenario of human-caused landscape changes in the northeastern United States. Forests are cleared and fragmented in favor of development. Some animals, particularly predators that rely on large tracts of intact habitat and abundant resources, have a hard time of it, perhaps disappearing. Other species, such as white-footed mice, thrive.

Valley in New York. Ostfeld’s research team is exploring how the risk of contracting Lyme disease seems to change with shifts in the diversity of species found in the forested landscapes of the northeastern United States.

Ostfeld’s field studies and computer models have revealed a predictable pattern linking the community of animals in local forested areas with the abundance of black-legged ticks infected with the bacterium that causes Lyme disease. This relationship, referred to as “the dilution effect,” is an active area of research.

The effect depends largely on the relationship between black-legged ticks and white-footed mice. Hungry ticks are

TOP LEFT TO RIGHT: Researcher Richard S. Ostfeld of the Cary Institute of Ecosystem Studies. A researcher finds a gray squirrel in one of the research team’s live-traps.

CENTER LEFT TO RIGHT: White-footed mice and other small mammals are tagged, weighed, and closely inspected for ticks before release back into the forest. A researcher records data during field work.

BOTTOM LEFT TO RIGHT: A researcher carefully inspects a northern cardinal for ticks before release. Researchers’ field notes.

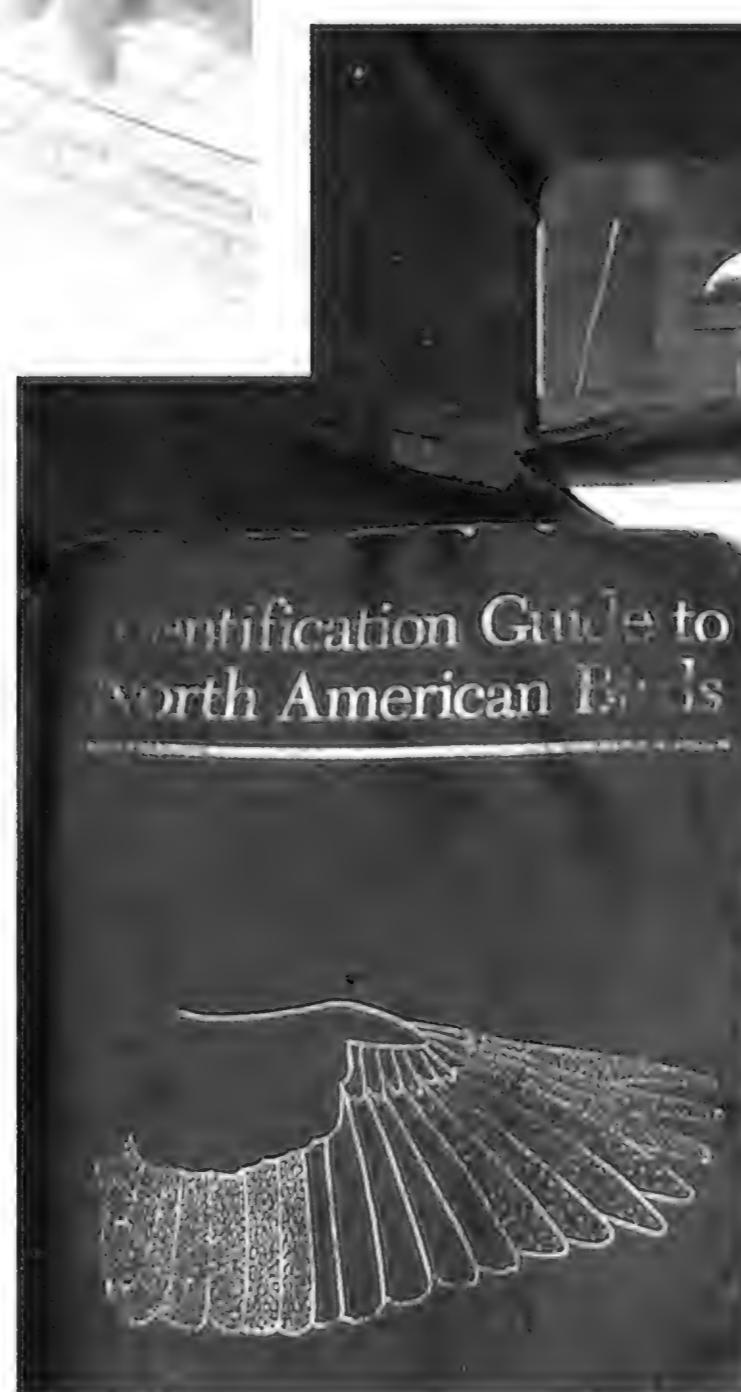
Cary Institute  
of Ecosystem Studies

Research

Education

Administration

Auditorium



MAPS BANDING CODES

Location  
Outer layer  
Type of skull: 1 NV or

primaries, secondaries, & tail  
Most species have molt pattern  
similar. Check 1/2 in 1997  
for each species

bone

2 - full, primary, secondary molt

3 - greater, primary, secondary

4 - lesser, feathers worn and

broken

5 - extremely worn, feathers  
loose, broken, feathers

6 - very light, light feather when removed

7 - very light, very worn, no traces of

feathers

8 - slightly, definitely worn but very little

feathers

9 - moderate, definitely worn but not

broken

10 - half, almost worn and

broken

11 - very worn, feathers

loose, broken, feathers

12 - very worn, feathers

loose, broken, feathers

13 - very worn, feathers

loose, broken, feathers

14 - very worn, feathers

loose, broken, feathers

15 - very worn, feathers

loose, broken, feathers

16 - very worn, feathers

loose, broken, feathers

17 - very worn, feathers

loose, broken, feathers

18 - very worn, feathers

loose, broken, feathers

19 - very worn, feathers

loose, broken, feathers

Age

1 - first prebasic molt, no

2 - first postbasic molt, no

3 - first prebasic molt, less than 1/2

4 - first postbasic molt

5 - second prebasic molt

6 - second postbasic molt

7 - third prebasic molt

8 - third postbasic molt

9 - fourth prebasic molt

10 - fourth postbasic molt

11 - fifth prebasic molt

12 - fifth postbasic molt

13 - sixth prebasic molt

14 - sixth postbasic molt

15 - seventh prebasic molt

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61 - thirtieth prebasic molt

62 - thirtieth postbasic molt

63 - thirty-first prebasic molt

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127 - fortieth postbasic molt

128 - fortieth postbasic molt

129 - fortieth postbasic molt

130 - fortieth postbasic molt

131 - fortieth postbasic molt

132 - fortieth postbasic molt

## WHO cooks for you?

COURTESY OF U.S. EPA



COURTESY OF U.S. EPA



DAVID PHILLIPS/VISUALS UNLIMITED

TOP A researcher examines a white-footed mouse. BOTTOM A black-legged tick is removed from a songbird. Ticks are sent to a lab to be analyzed for the presence of the bacterium that causes Lyme disease. INSET *Borrelia burgdorferi*, the bacterium responsible for Lyme disease.

As biodiversity declines, what's left is an animal community dominated by creatures that just happen to be the among the most efficient at transmitting the bacterium responsible for causing Lyme disease, currently the most frequently reported animal-borne disease in the United States.

### Scientific Sleuths

Anyone living in the eastern third or so of the United States is well aware of the apparent increase in Lyme disease incidence, but it is not the only one that appears to be strongly influenced by changes in biodiversity. In an analysis of both epidemiological and ecological studies conducted over the past several years, Pongsiri and research partner Joe Roman, a biologist at the University of Vermont's Gund Institute for Ecological Economics, identified malaria, West Nile virus, schistosomiasis, hantavirus pulmonary syndrome, and Lyme disease as all having links to biodiversity change, decline, and extinction. Three of these diseases—Lyme disease, malaria, and West Nile virus—are being studied as part of the biodiversity and human health research effort by EPA and its partners.

To investigate the dynamics of mosquito-borne diseases such as malaria, researchers at EPA and the Smithsonian Tropical Research Institute in Panama are monitoring mosquito species diversity at both intact and disturbed forest plots. The scientists hope to discern how landscape changes relate to the pathogens responsible for mosquito-borne diseases.

To start, the researchers are establishing a baseline survey to compare mosquito diversity (composition, abundance, and distribution) across habitats with different levels of forest disturbance.

What researchers learn will be added to the Smithsonian's planned VectorMap initiative to provide of a picture mosquito-species richness and diversity across the globe. This research, coupled with an understanding of the relationship between diversity and land-use change, has the potential to provide critical information for developing land-use and integrated pest management strategies aimed at reducing the risk of mosquito-borne disease.

Closer to home, research teams are exploring how the diversity of wild bird species may be linked to the spread and transmission of West Nile virus. Its emergence in the United States was only confirmed in 1999 when a Bronx Zoo pathologist, concerned about a rash of crow deaths too close to the zoo for her comfort, convinced public health officials to reinvestigate a handful of human cases originally misdiagnosed as St. Louis encephalitis.

"The finding of West Nile virus in New York stunned experts, who have no theory so far on how the strain found its way here," reported Jennifer Steinhauer in the *New York Times*.

### Tools for Human Health

While the emergence of the West Nile virus is still a mystery, its transmission is linked to changes in biodiversity. Researchers from the University of California at Los Angeles are combining satellite-based remote sensing data with feather analysis to document the role that migratory birds play in disease transmission. Another team, from Rutgers University in New Jersey, is studying how the prevalence of West Nile virus is related to plant, mosquito, and avian diversity.

"The work that we and our research partners do can have an important impact on how people view and understand biodi-

versity," says Pongsiri. "The overall goal is to provide information that can be applied to develop tools and models of disease risk that individuals and decision-makers can use to reduce and maybe even prevent disease."

One such tool was recently released by a team at the Yale School of Public Health. It's a smartphone app that provides a map of infected-tick density. Hikers who find a high infected-tick density overlapping their favorite trail can access a list of recommended precautions, such as applying insect repellent, wearing long pants and sleeves, and carefully inspecting themselves for ticks after they get out of the woods. The program also provides tick images so that people can identify different species.

The next step is providing tools to help entire communities make decisions about land use and environmental protection that incorporate a full understanding of the link between biodiversity and public health. "One of the societal benefits that biodiversity could provide," says Pongsiri, "is the regulation of disease. If we can develop the scientific foundation to support this, we want to quantify the benefit of biodiversity in public health terms. This can help inform and improve decision- and policy-making for the environment and for human health."

That environment includes the woods beyond my house. Could the owls that return each spring to ask "Who cooks for you?" and hunt mice be boosting the health of my family by protecting us from disease carriers? Perhaps. It's a powerful, personal argument for advancing what we know about the importance of biological diversity. 

— AARON FERSTER served as the Zoo's lead exhibit writer for ten years before becoming a science writer at EPA.

## New Zoo Exhibit Explores Biodiversity and Human Health

As this article illustrates, there is a growing body of scientific evidence finding important links between the loss of biological diversity and the risk of human infectious diseases. That connection is the subject of a new, interactive exhibit set to open

in the Amazonia Science Gallery's Biodiversity Lab later this summer.

The exhibit, developed as part of a National Zoo-EPA partnership, invites visitors to explore how biodiversity can help protect people from

certain diseases, and gives them insight into the latest research linking environmental change, ecosystem services, and human health.

An online version of the exhibit will be available at [epa.gov/research/biodiversity](http://epa.gov/research/biodiversity).

**Animals need food, water, shelter—and paint? Well, yes. Animal art is an increasingly important enrichment tool.**

# creature creations

BY ALLIE KILLAM



**V**isitors to the Zoo whispered and wondered. They were watching the popular young lions, born in 2010. And something seemed odd: The cats were wearing different colors!

One had a patch of red. Was it blood? people wondered nervously. No, it was too bright for that. Some colors were obviously not natural: swaths of blue, dabs of green. It looked almost as if the colorful cats had run amok in a paint store. But how could that have happened?

It hadn't, of course. Yet the lions were indeed sporting coats of paint. That's because earlier in the day, they'd had their first try at an increasingly popular enrichment activity—painting.

## The Art of Enrichment

Like many zoos nationwide, the Smithsonian's National Zoo offers animals the opportunity to dip their paws, claws, and more in nontoxic, washable paint. Painting enriches animals' lives in

several ways, explains Heidi Hellmuth, who recently served as the Zoo's curator for enrichment. It provides social interaction with a keeper as well as cognitive training from learning a new activity. Paint also engages the senses, as animals see it, smell it, and feel it. The experience is particularly tactile for animals, such as elephants, that wield a brush.

Zoo staff try to structure animal art lessons to draw as much as possible on natural behavior. Sloth bears, for instance, feed by blowing away dirt on the forest floor and sucking up termites. So keepers gave the bears an oversized straw-like apparatus that they could use to blow paint onto the canvas. The ursine artists often pause, admire their work, and continue painting while the other bears sit and watch.

Because the Zoo has more than 400 different species, there are literally hundreds of different ways to create a painting. Each keeper experiences trial and error when working with the animals.



MEHGAN MURPHY/NZP

After several years of working in the Small Mammal House, keeper Kenton Kerns has gotten to know its residents very well. "Because they're regularly held by keepers, it was easy to introduce the critters to paint. And later clean them off," he says. Animals naturally groom and keep themselves clean, so the paint is usually gone by the next day. Just in case, however, keepers will leave notes to each other, explaining who painted and with what colors. "We want to make sure a naked mole-rat hasn't turned green overnight," says Kerns with a laugh.

Courtney Janney, a keeper on Asia Trail, approaches painting as a training procedure. "You have to be able to clean them off afterwards, so we start with getting them comfortable around the hose," she explains. The next step is to be patient and wait. "You have to let them explore on their own terms. Paint is squishy, and it smells. They have to decide there's no threat first."

It didn't take too long for Janney to train the cats on Asia Trail. She's not sure if the animals were spurred by the desire to display their artistic talents or to earn treats. "Animals can choose whether or not they want to participate. They all do, willingly, so they're enjoying it on some level," she says.

Some animal artists really get into it. When Mei Xiang, the Zoo's female giant panda, first painted, she loved the smell so much, she proceeded to smear paint all over her face. The keepers' jaws dropped. What would the public think when they saw a tie-dyed panda? Turns out visitors took it in stride.

## Claws and Macaws

Like her artistic offspring, the lioness Shera loves to paint. She truly puts herself into her work: Keeper Kristen Clark has a collection of paintings whose numerous claw marks testify to the artist's desire to keep her masterpieces. Shera's artistic inclinations are not shared by her fellow lioness, Naba. She's "too cool for painting," says Clark with a smile.

Lion painting requires a lot of brainstorming and cooperation among animal caretakers. "It's a two-person job," says

Clark. "Someone has to watch the front end of the cat, where the teeth and claws are." Now and then, the other person asks the lion to stand on its hind legs and then replaces the cat's creation with a fresh piece of paper. The keepers do all this through slots in the sturdy mesh that separates them from the painterly predators.

Because the keepers have such close relationships with their charges, they can easily detect any indication of stress. Painting is never unsupervised. So when Clark first attempted painting with the lion cubs and some reacted by hissing and swatting at the

Some of Mac's Bird House neighbors take a more mercenary approach to their artistic endeavors. Kiwis, keeper Kathy Brader jokes, "will work for food!" The flightless New Zealand birds will run around, spreading paint with their feet, if they're plied with enough treats.

## Creative Challenges

Unlike the kiwis, some animals don't enjoy wet paint. Kibibi, the Zoo's youngest gorilla, stands out in this regard. Fortunately, apes have the option of wielding a brush with their hands.

**Like her artistic offspring, the lioness Shera loves to paint. She truly puts herself into her work.** Keeper Kristen Clark has a collection of paintings whose numerous claw marks testify to the artist's desire to keep her masterpieces.

unfamiliar items, keepers quickly stopped the activity to prevent any anxiety.

"It's surprising how scary a white floating thing is," says Kerns, talking of paper and canvas. Before Hilary Colton, a Bird House keeper, tried to paint with the green-winged macaw named Mac, she first got him used to having the canvas nearby. Mac was aware of the new object, but unafraid, says Colton. During the next training session, the keepers tried a few different brushes, but Mac didn't care for holding sticks in his beak.

So Colton got creative. She put peanut butter (a treat) inside a paper towel roll. Then she attached leaves that had been dipped in paint. She presented this innovative "brush" to Mac, and he took it. Indeed, he liked the new sensation so much that he refused to relinquish the brush when it was time to add more paint to the leaves!

With time and practice, Mac became an adept artist. This provided more than just cognitive enrichment. "The face-to-face time helps create a bond between keeper and animal," explains Colton.

Some orangutans, on the other hand, like painting themselves and the walls, notes keeper Becky Malinsky. "Some keepers wear painting-specific sweatshirts, because the expressive apes can be messy," she says. "Anytime I hold a canvas, they come right over. They'll pick and choose their own paint colors as well." Orangutans enjoy painting so much, they'll tussle with one another over who gets to do it. There's also the minor detail that the primates sometimes try to eat the paint. Keepers prevent this by offering the animals grapes instead.

Amphibians present a different issue: Their delicate skin is far too sensitive to come into contact with paint. Keepers got around this obstacle by creating "paint" of their own. They took the powdered algae mixture that the Zoo's frogs eat and mixed it with water to create a paint-like substance—organic and edible. The critters hopped happily, creating artwork of tiny frog footprints.

The lizards were very intrigued by their artistic opportunities. "Some of the lizards were like, 'What's that?'" reports

Watkins. The Komodo dragon, a large and very intelligent lizard, enjoys the activity. "Painting seemed to pique his curiosity," says Watkins. "His tongue was flicking." The lizard was never aggressive, but he did seem to find the new sensations enriching.

"You really have to be in tune with the animal," explains Kerns. He learned this the hard way. On one occasion, he was painting with a greater Madagascar hedgehog tenrec

that he knew was approaching torpor (a state similar to hibernation). He didn't realize quite how close the critter was until it passed out on the canvas!

#### Pictures at an Exhibition

With all this artistic activity, the Zoo has amassed quite a collection of critter creations. The animals' artistry caught the eye of John Thomann, an Asia Trail interpreter. He discussed the subject with



PAMELA BAKER-MASSON/NZP



TOP: Baruti holds a specimen of animal artwork.  
BOTTOM: Luke's paw is red from taking a print.

## creature creations

Sloth bears, for instance, feed by blowing away dirt on the forest floor and sucking up termites.

So keepers gave the bears an oversized straw-like apparatus that they could use to blow paint onto the canvas. **The ursine artists often pause, admire their work, and continue painting while the other bears sit and watch.**

his colleagues at Gensler, an architectural firm. They were enthusiastic, and the company provided funding for many of the art supplies now used at the Zoo.

Gensler also invited the National Capital chapter of the American Association of Zoo Keepers (NCAAZK) to mount an animal art show at the firm's D.C. office. Kerns, the NCAAZK president, reached out to his fellow chapter members, and a new wave of painting began. Each unit, from the

giant pandas to the invertebrates, eagerly participated. Obliging colleagues at the Pittsburgh Zoo even sent artwork by our sea lions, lodged there until their new home on American Trail is completed.

Lucky Zoo visitors witnessed part of the preparation for the show: the prairie dogs' first painting session. "It was nice to see the public's reaction," says Clark. "They thought it was just the coolest thing." Visitors were particularly amused when some of the

plump rodents sat down in the paint. "It was funny to see these little purple and blue butts going down the holes," Clark recalls.

"What the keepers do is nothing short of amazing," says Hellmuth. Kerns agrees: "There are some great results when we really challenge ourselves. It's amazing the amount of variety we have." That variety, nearly 100 examples of it, is now dazzling Gensler's employees and clients. (The show, unfortunately, is not open to the general public. NCAAZK hopes to organize a more public show in the future.) Any funds raised by sale of the artwork will support keeper training and purchase painting supplies.

The show has a more intangible goal as well—raising awareness. After all, these striking, colorful images are conversation pieces. "The painting is a hook," explains Hellmuth. "If people have never heard of an elegant crested-tinamou, they might be more interested in the bird and take the time to learn." They may even, Hellmuth hopes, get involved in the global challenge of conserving our natural world.

### The Human Factor

Besides enriching animals' lives, their artistic endeavors also enliven the work of Zoo staff. "I think the keepers get the biggest kick out of it," says Clark. Invertebrates keeper Mike Henley agrees: "How many people can come home and say, 'I had a bear paint today'?"

Painting doesn't always go as planned, of course, and it isn't always easy. Still, NCAAZK members eagerly persist. Animal art, as Clark puts it, is "another way people can feel a particular connection to the animal or species." Fostering that connection is, after all, a paramount goal for the Zoo and its staff.

The best part, Kerns says, is that "the animals will never not need enrichment." So let the painting continue! 

— ALLIE KILLAM was an editorial intern for Smithsonian Zoogoer.

LEFT: Kibibi, the Zoo's youngest gorilla, tries her hand at art.

FACING PAGE, TOP: A naked mole-rat spreads paint by walking across paper.

FACING PAGE, BOTTOM: Mei Xiang, the Zoo's female giant panda, is an enthusiastic artist.





MEGHAN MURPHY/NZP



SMITHSONIAN'S NATIONAL ZOO

# Sea you real soon!

**Join us for a special members-only preview of American Trail!**

Dive into our newest exhibit, American Trail! Learn about 8 amazing North American species and check out the new state-of-the-art home for our seals and sea lions. FONZ members will be among the first to experience this amazing new addition to the Zoo. Watch your email for a special invitation or check the members-only page on our website for updates.

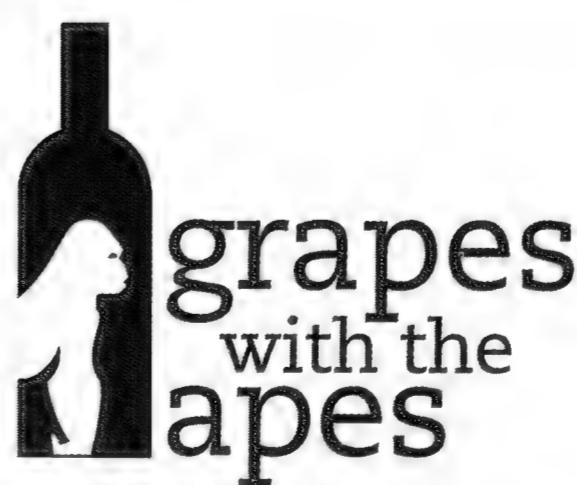
**SAVE THE DATE!**

**Friday, August 31 and Saturday, September 1. For more information, call 202-633-2922 or visit [FONZ.org](http://FONZ.org).**



## Raise Your Glass

Toast wildlife conservation at the Zoo's annual wine-tasting event, Grapes with the Apes! Sample wines from the area's best vintners, enjoy live music, and learn about great apes and our efforts to protect them. Proceeds support the Zoo's conservation efforts creating a full bodied experience that you are sure to enjoy. Buy tickets today at [fonz.org/grapes.htm](http://fonz.org/grapes.htm).



Thursday, September 20  
6-9pm at the National Zoo  
This event is 21 and over. Rain or shine.

## BEAST BITS

### Not So Poisonous Frogs

Poison dart frogs are one of the best-known examples of an animal that is brightly colored to warn potential predators that it might not be such a tasty snack. But the frogs you see in the Amazonia exhibit are not poisonous! That's true of all poison dart frogs kept in zoos. Scientists believe that poison dart frogs in the wild get their poison from eating insects, which get it from eating plants that contain poison.

### Keep It Down!

Sometimes the Zoo is a noisy place, and that's particularly true in the Small Mammal House, home to our family of black howler monkeys. They aren't called "howler" monkeys for nothing—in fact, they are the loudest animal in the Americas. These animals have a special voice box with a particularly large version of the hyoid bone, which makes them especially loud. Remarkably, the calls of male howler monkeys can be heard as far as three miles away, even in the dense forests where they live. Male monkeys howl to keep other males away from their food.



JESSIE COHEN/NZP

### Zoo Clue

This colorful creature can push its stomach outside its body to digest food! Learn more at [nationalzoo.si.edu/goto/zooclue](http://nationalzoo.si.edu/goto/zooclue).



JESSIE COHEN/NZP

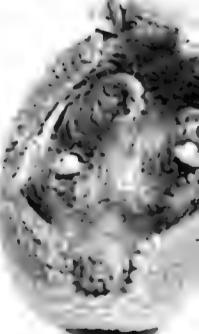
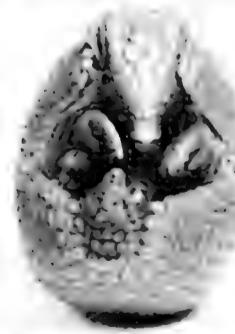
CREATURE  
FEATURE

**Critters  
ON A ROLL**

The SOUTHERN  
THREE-BANDED  
ARMADILLO  
takes on predators  
with a unique tactic

BY SIERRA HAHN-VENTRELL

MARK BOWLER/  
NATUREPL.COM



### ARMED but Not Dangerous

These odd-looking South American creatures have small eyes, big ears, long claws, and hard bony plates for protection. That's where they get their name, which means "the little armored one" in Spanish.

### Fear FACTOR

"Yikes, a predator! Do I run? Do I hide?" Instead, the southern three-banded armadillo decides to curl up in a ball. In fact, it's the only armadillo species that can roll up when frightened. It tucks its ears in and fits its tail and head together so predators can't reach its soft belly.

### DINNER Time!

Armadillos have bad eyesight, so they rely on their ears and noses to locate food. In the dry season, armadillos dig up colonies of ants and termites; in the wet season, they eat fruit and beetle larvae. Zoos typically feed them leaf-eater biscuits, cat chow, banana slices, and bee moth larvae. The Smithsonian's National Zoo's armadillos' favorite treat is waxworms, which are moth larvae.

### Let's Go for A SWIM!

Swimming is a crucial way for armadillos to find food and shelter. The doggy paddle could be renamed the armadillo paddle, but that isn't the only skill they've mastered. They can hold their breath for five minutes while they dive and walk along the bottom of a stream or pond.

### THE LITTLE Armored One

Called a pup, a newborn armadillo is about the size of a golf ball and very vulnerable. It can't see, it can't curl up, and it has not yet grown its tough armor. But after 72 days, the pup no longer relies on its mother and will venture out into the world alone.

### At the ZOO

Roll on up and come down to the Small Mammal House to see Howard, Bonnie, and Julian. Howard is a bit shy, so he may be rolled up, but Bonnie and Julian love to go exploring so they'll be happy to come out and have a ball!

## YOUR TURN Who's Who?

**Think all red pandas look the same? Not so fast. Take Shama and Tate. Shama's face and forehead is lighter than Tate's, and the ring around her face is narrower. Tate has more noticeable white "eyebrows," his tear marks are darker and thicker, and he has a little bit of black fur above his nose.**

**In this photo, can you tell which panda is Shama and which is Tate?**



ANN BATDORF/NZP



## The Voice of the Zoo

LINDSAY RENICK MAYER, Communications Specialist



BRIAN GRATWICKE/SCBI

**The Smithsonian's National Zoo doesn't just take immaculate care of its residents; it also provides an outlet for conservation research, wildlife preservation, and educational resources. To share all of this information with visitors and the larger public, the Zoo has a communications team to spread the word.**

Lindsay Renick Mayer is a communications specialist at the National Zoo. Since childhood, her passions for writing and animals have led her to be a part of the voice of the Zoo's news. She studied undergraduate journalism at the University of Wisconsin-Madison and then received her master's in journalism from Northwestern University.

Renick Mayer spends most of her days working with the media to get the Zoo's news out to the world. She writes news releases and works with reporters to communicate why wildlife and nature are so important and

what people can do to help. "I really strive to get the word out about our amazing colleagues and the work that they're doing for conservation," Renick Mayer says.

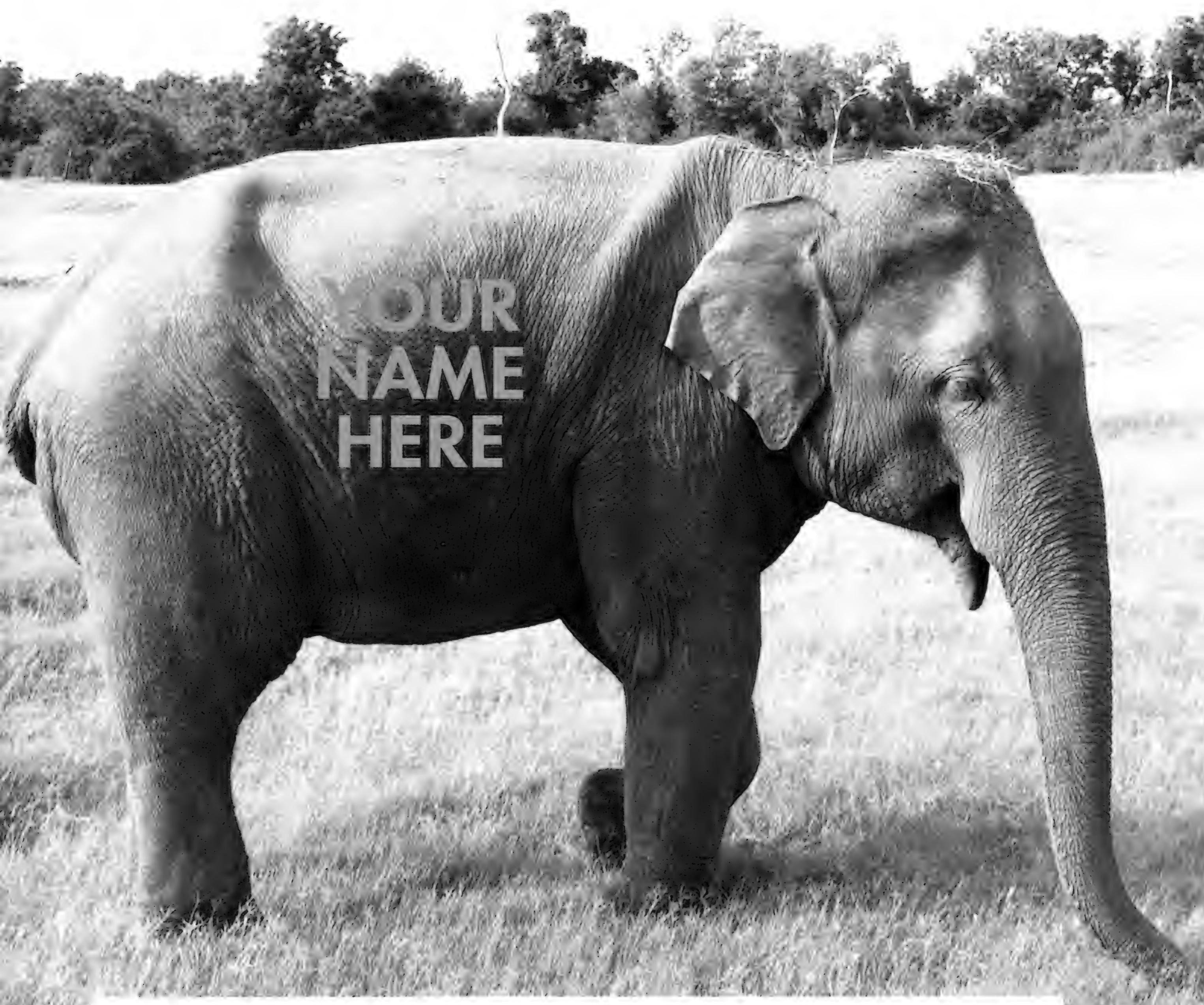
The most rewarding part of communicating for the Zoo is getting attention for the critters Renick Mayer considers underdogs. The Zoo's salamanders and leaf-cutter ants, for example, don't usually get the same kind of media attention as a pride of lions. Part of Renick Mayer's job is to crack the code and figure out how to make warty little toads just as glamorous as tigers.

As the public relations lead for the Panama Amphibian Rescue and Conservation Project, Renick Mayer helps run the website for the project and works with reporters at the local, national, and international level to spread the word about the plight of the world's amphibians. As part of this work, Renick Mayer traveled to the rainforests of Panama with Smithsonian scientists to care for individual frogs that are the last of their species. Even on her own time, Renick Mayer enjoys scouring the woods for frogs, salamanders, and views of other wildlife.

Renick Mayer also helps with the Zoo's social media efforts, most recently spearheading efforts to join Zoo scientists in live tweeting the artificial insemination of giant panda Mei Xiang.

The best part of working at the Zoo? Going behind-the-scenes to see animals from a unique vantage point, Renick Mayer explains. But her favorite part of working for the Zoo is that it's "filled with people who have values similar to mine—people who care about individual animals, species, ecosystems and who want to spend their time as stewards of our planet," she says.

— Allie Killam



**No, we are not actually going to put your name on an elephant!** But by donating to Elephant Trails, you'll receive the next best thing. Contribute \$250 or more and have a 4"x 8" tile—with your name on it—installed into the foundation of the ground-breaking Elephant Trails exhibit. Elephant Trails: A Campaign to Save Asian Elephants is a comprehensive breeding, education, and scientific research program designed to help scientists care for elephants in zoos and save them in the wild. The cornerstone of this effort is a new, expanded home for elephants at the Zoo. If you want to go really big, life-size elephant footprints are also available for larger donations. Donate at [www.fonz.org/bricks.htm](http://www.fonz.org/bricks.htm) and leave your mark on the Smithsonian's National Zoo today!

All tiles will be installed in the finished Elephant Trails exhibit area. Exhibit completion estimated 2013.

**FONZ RESOURCES****fonz.org****Membership  
Information  
202.633.2922****Special Events  
202.633.4470****Development Office  
202.633.3033****Camps and Classes  
202.633.4470****Volunteer Services  
202.633.3025****Comments? Questions?****Please email us at  
[fonzmember@si.edu](mailto:fonzmember@si.edu)****Not a FONZ  
member yet?****Call 202.633.3034  
or go to  
[fonz.org/join.htm](http://fonz.org/join.htm)**

MEGHAN MURPHY/NZP

# Thanks to Our ZOOFAPI Superstar Restaurants!

**FIVE-STAR SUPPORTERS***These restaurants helped promote ZooFari and contributed items to the auction.*

8407 Kitchen Bar  
Art and Soul  
Bandolero  
Bastille  
Belga Café  
Bistro 525 at The Washington Court Hotel  
Cabot Creamery Cooperative  
Cava Grill  
Cava Mezze  
Ceiba  
Chef Geoff's Downtown  
Cuba Libre Restaurant & Rum Bar  
Cure Bar & Bistro  
Dino  
Eamonn's

Edward Marc Chocolatier  
Equinox  
Estadio  
Et Voila! Restaurant  
Federal City Bar  
Firefly  
Firehook Bakery and Coffee House  
Georgetown Cupcake  
Graffiato by Mike Isabella  
The Grille at Morrison House  
Hank's Oyster Bar  
Hill Country Barbecue Market  
Jackson 20  
Kellari Taverna  
LIA'S  
The Light Horse

The Majestic  
matchboxfoodgroup  
Mie N Yu  
Muse at the Corcoran  
Old Glory BBQ  
Old Hickory at Gaylord National Resort  
Ping Pong Dim Sum  
Plume at The Jefferson Policy  
Poste Moderne Brasserie  
Potenza  
Proof  
PX  
The Queen Vic  
Quill at The Jefferson  
Redwood Restaurant  
Restaurant Eve  
Ripple  
RIS

Society Fair  
Sonoma Restaurant and Wine Bar  
Station 4  
Sugar Magnolia  
Sugo Cicetti  
Ted's Bulletin  
Thunder Burger & Bar  
Todd Gray's Watershed  
Tonic at Quigley's Pharmacy  
Tonic Mount Pleasant  
Tonic Last Exit  
Ulah Bistro  
Urbana Restaurant and Wine Bar  
Virtue Feed and Grain  
Zengo  
Zentan at Donovan House  
Zola

**FOUR-STAR SUPPORTERS***These restaurants helped us promote this successful event.*

1789 Restaurant  
Ardeo + Bardeo  
Armand's Chicago Pizzeria  
Bar Pilar  
BLT Steak  
Brasserie Beck  
Cafe Saint-Ex  
Casa Nonna  
Central Michel Richard  
Charlie Palmer Steak  
Clyde's of Georgetown  
Delia's  
Dolci Gelati

Entyse Wine Bar & Lounge at The Ritz-Carlton, Tysons Corner  
Fuel Pizza  
FUJIMAR Restaurant  
Hard Times Cafe  
Hello Cupcake  
Indique  
Indique Heights  
Juniper Restaurant  
Luke's Lobster  
Maggiano's Little Italy  
Marcel's  
Michel Richard Citronelle  
Mintwood Place

Mitsitam Native Foods Cafe  
Mussel Bar  
Occidental Grill & Seafood  
The Oceanaire Seafood Room  
Olazzo  
Perrys  
Popped! Republic  
Rocklands Barbeque and Grilling Company  
The Sugar Cube  
Taberna del Alabardero  
Whole Foods Market

For a complete list of the 100-plus ZooFari restaurants, please visit [fonz.org/restaurants.htm](http://fonz.org/restaurants.htm).



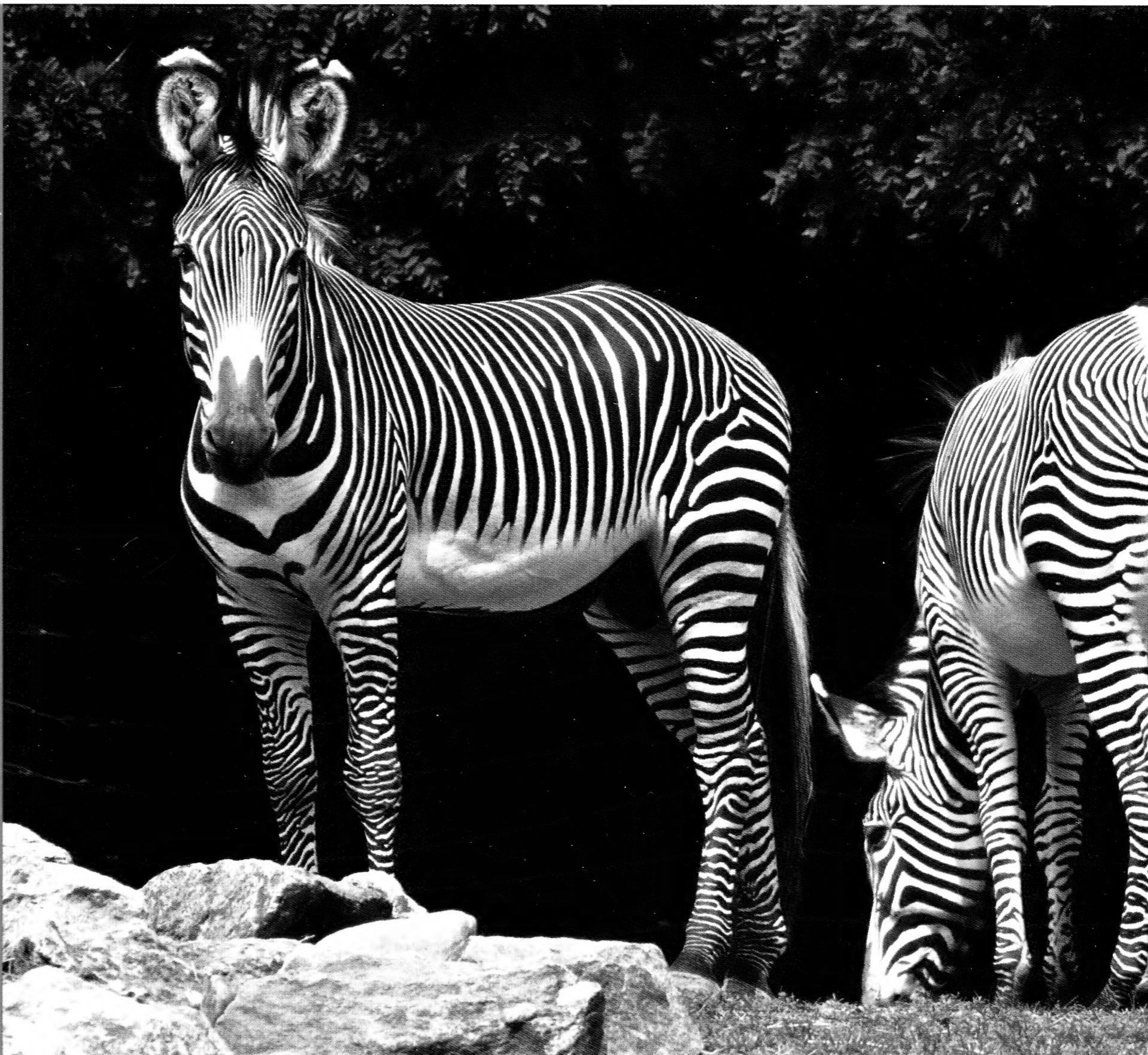
## Calling All Kids! FONZ FALL CLASSES

Looking for a way to engage your children's curiosity and get them interested in learning? Then sign up for one of FONZ's award-winning classes, the wildest educational opportunity in town.

Our offerings explore the natural world from anteaters to zebras.

Find class descriptions and details at [fonz.org/classes.htm](http://fonz.org/classes.htm).

MEGAN MURPHY/NZP



## Be Sun-Smart This Summer!

**D.C. gets hot this time of year.** Perhaps you've noticed. So FONZ has been working with the American Academy of Dermatologists to identify ways for Zoo visitors to protect their skin. Watch for new signs in the park and information on our website. Meantime, don't forget the sunglasses and sunscreen! Didn't come prepared? No problem; we sell both in our shops.

## FONZ Board Election

Eight members of the FONZ Board will be running for reelection this fall. We thank them for their dedication!

Annie Bissell	Timothy Lynch
David Grimaldi	John Piper
Walter Jones	Karen Silberman
Maureen Lemire	Sheila Walcoff

Instructions for member voting will appear in the September-October issue.



JESSIE COHEN/NZP



KATRINA DEPTULA/NZP

## One Last Look

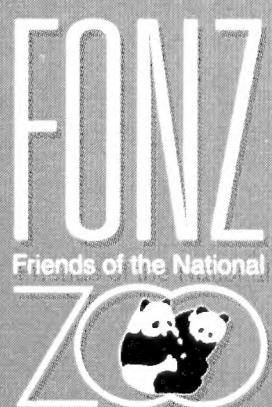
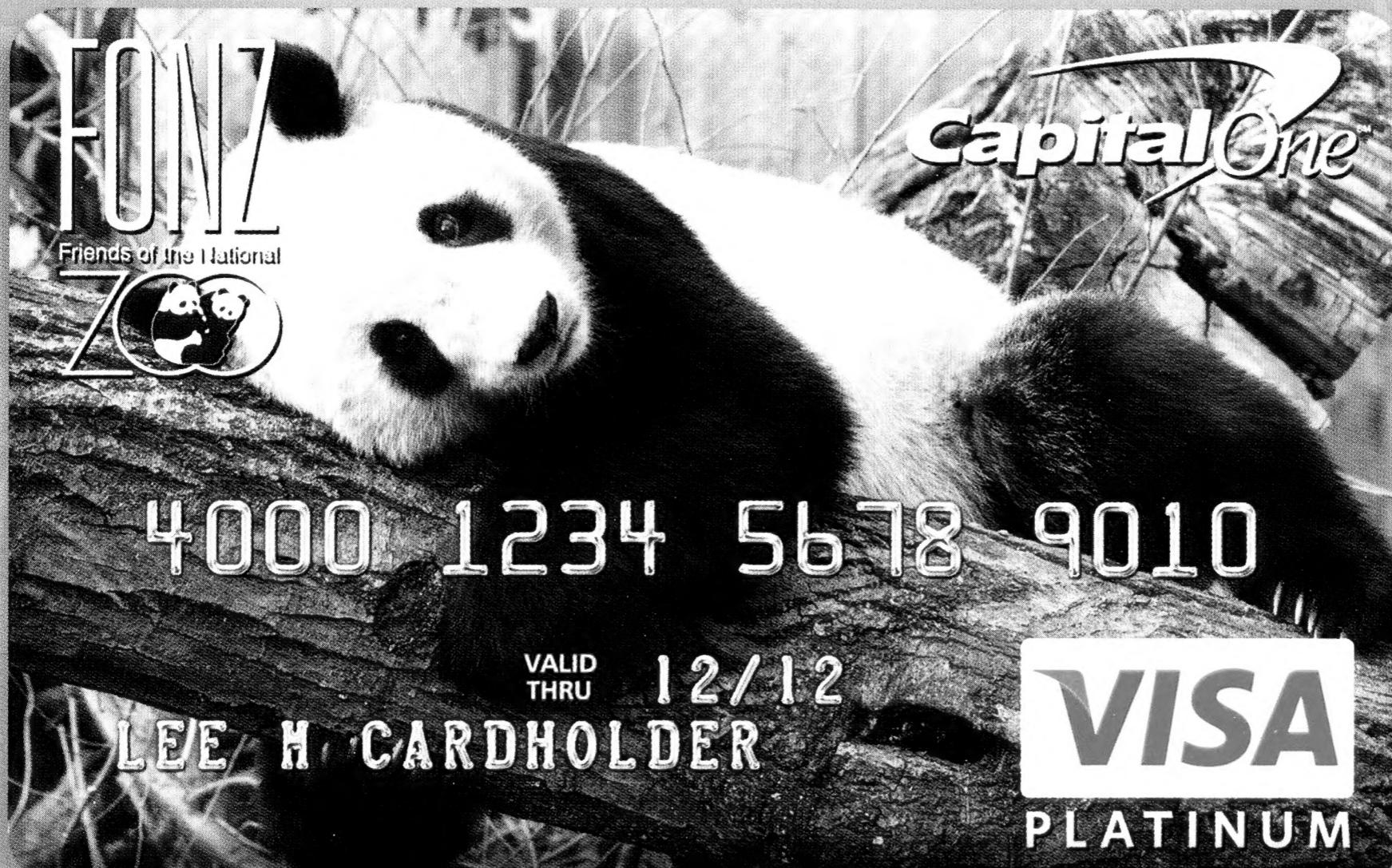
**This summer, Aslan and Baruti, two of the seven young lions born in 2010 to city-wide celebration, departed for Canada's Calgary Zoo.** There, in due time, they will hopefully breed with genetically suitable females. Communications intern Katrina Deptula caught this striking shot of Baruti's paw during the cat's pre-departure veterinary exam.

**Technical Notes** — CAMERA: Canon EOS 70; FOCAL LENGTH: 40 mm; EXPOSURE: 1/60 second at f/5

**Smithsonian Zoogoer** welcomes FONZ members' submissions of photos taken at the Zoo. Please send photos to [zoogoer@si.edu](mailto:zoogoer@si.edu). We will contact you if we are able to use your picture for the Zoo View page.

# SAVE ANIMALS, EARN REWARDS

SHOW YOUR SUPPORT FOR FONZ AND  
EARN 1.25 MILES FOR EVERY \$1 SPENT

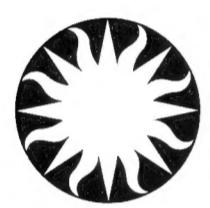


Friends of the National Zoo (FONZ) has partnered with Capital One® to offer you three credit card options to fit your needs. Choose a card that earns you great rewards, one with a low introductory APR or another to help build your credit. Plus, you can choose an image for your card that highlights your support for FONZ. Apply today!

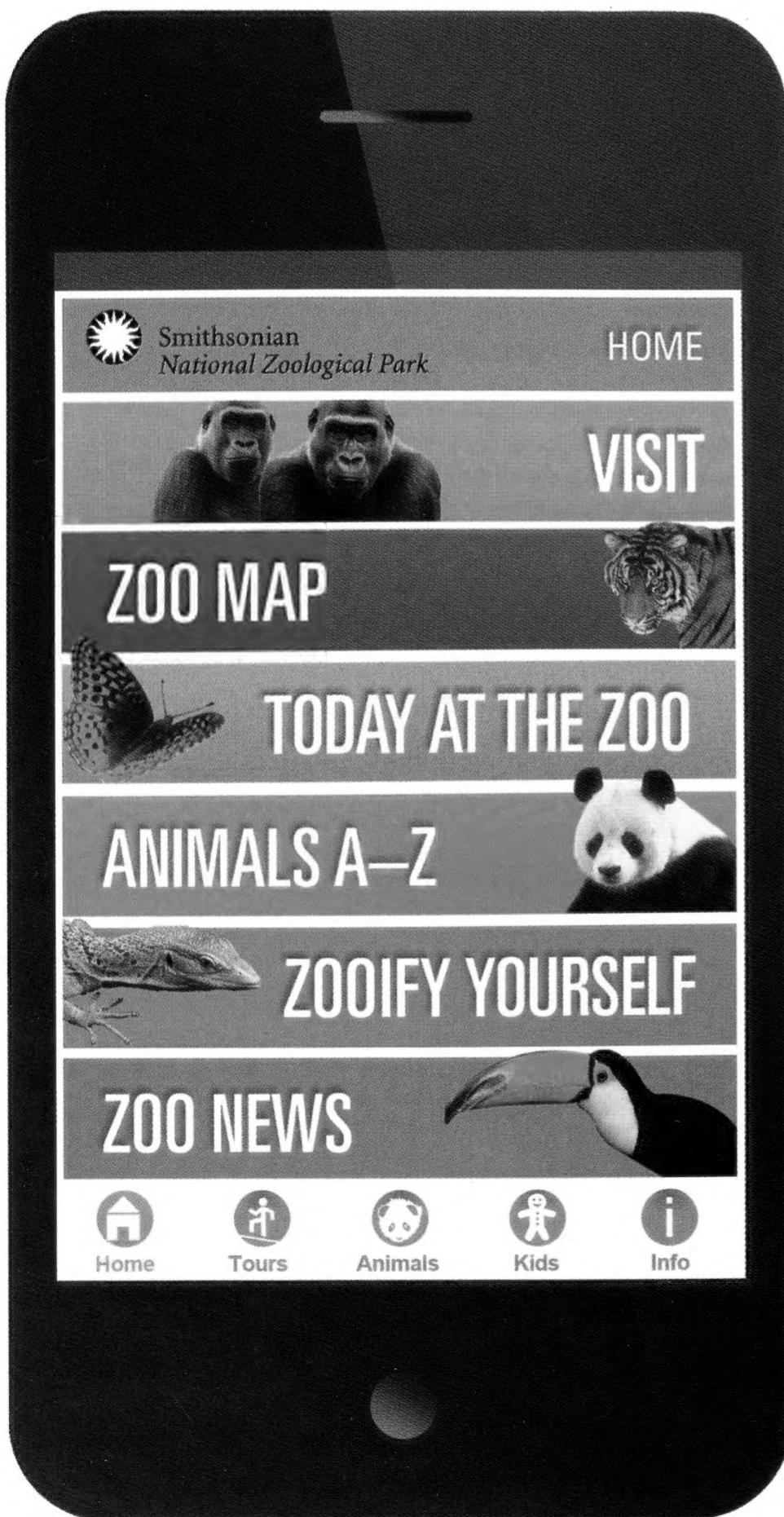
[www.fonz.org/visa](http://www.fonz.org/visa)



Friends of the National Zoo, PO Box 37012, MRC 5516, NW, Washington, DC 20013-7012, [www.fonz.org](http://www.fonz.org)



Smithsonian  
National Zoological Park



**Thank you for joining FONZ.**

Your membership supports animal care, science, conservation, and more.



**Animals, Webcams, Maps, Videos, Customizable Tours, Demo Schedules, Zoo News, Visitor Information, Nearby Animal Locator, Animal Voices, Zooify Yourself and so much more!** With our new National Zoo mobile phone app you can take the Zoo with you wherever you go. Coming this summer to the App Store and Google Play. **Put a panda in your pocket!**